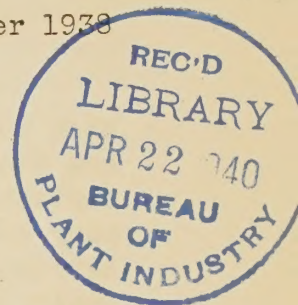


# THE · EXTENSION PATHOLOGIST

A NEWS LETTER FOR EXTENSION WORKERS INTERESTED IN PLANT DISEASE CONTROL

Serial Number 34

November 1938



CONFERENCE OF EXTENSION PLANT PATHOLOGISTS FROM  
NEW YORK AND PENNSYLVANIA  
Lycoming Hotel, Williamsport, Pennsylvania, July 28, 1938

Reported by R. S. Kirby

## Objectives

The objectives of the conference were to have the specialists from each State compare ideas and recommendations on such important plant-disease-control problems as:

(1) How the plant-disease-control objectives fit into the State extension program;

(2) To discuss the relative importance of various plant diseases in the two States, in order that there may be a better understanding of the work;

(3) To standardize control methods on each important crop, in order that there may be less confusion to growers living along the State boundaries of the two States;

(4) To discuss the plans of conducting plant-pathology extension work, so that the workers in each State may better understand the methods followed in the neighboring State.

The meeting was called to order, and Dr. R. J. Haskell, extension plant pathologist of the United States Department of Agriculture, was elected chairman, and R. S. Kirby was elected secretary.

The following persons were in attendance at the conference:

Dr. Karl H. Fernow, Ithaca, N. Y.  
Mr. H. W. Rankin, State College, Pa.  
Mr. A. H. Bauer, State College, Pa.  
Mr. O. D. Burke, State College, Pa.  
Dr. Charles Chupp, Ithaca, N. Y.  
Mr. Robert H. Rumler, county agent, Williamsport, Pa.  
Mr. Albert E. Cooper, State College, Pa.

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Dr. W. D. Mills, Ithaca, N. Y.  
Mr. M. E. Robinson, Ithaca, N. Y.  
Dr. M. F. Barrus, Ithaca, N. Y.  
Dr. R. S. Kirby, State College, Pa.  
Dr. R. J. Haskell, Washington, D. C.

Dr. Haskell, in the opening address, stated that plant-disease extension work in New York and Pennsylvania was estimated to cost the Federal and State Governments nearly \$50,000 a year; but that the work had been definitely shown to be saving the growers many times its cost; further, that many developments in agriculture have come in during the past 10 years, and extension plant pathologists should keep in mind changes that would make their programs of the most help in the general programs. In particular, these objectives are to help the grower to make a larger farm income; to reduce the cost of unit crop production; and to assure the growers of a more constant level of income. Also, that plant-disease control plays an important part in conserving the soil.

New York reported that the commercial or larger growers are more responsive to adopting extension control methods, since they are in a position to understand better the importance of preventing severe losses from crop diseases. It was brought out that in New York the different departments were attempting to formulate coordinated general crop programs. The extension workers in Pennsylvania felt that a plan of coordination would be of decided help, and made the further suggestion that many commercial agencies have given valuable aid in furthering plant-disease-control projects.

#### Standardization of Control Measures

Potatoes, K. H. Fernow, discussion leader. A discussion of spraying and dusting in New York and Pennsylvania showed marked differences in the recommendations of the two States. New York tended to favor the high-to low copper concentration spraying, while Pennsylvania recommended the standard 4-4-50 bordeaux. Reasons for differences were discussed. Differences were seemingly due to findings of the research workers in the two States.

On the control of scab and Rhizoctonia, New York reported that the hot-formaldehyde treatment seems to give the potatoes a smooth appearance. Formaldehyde is more effective against scab than Rhizoctonia. It was reported that mercury seed treatments tend to increase scab, and that the best scab control is the regulation of the pH reading of the soil.

Pennsylvania reported that seed treatment had given variable results, and that apparently the pH value and humus content of the soil were most important in scab control.

Fruits, W. D. Mills, discussion leader. The disease-control program for fruits in both New York and Pennsylvania were in complete accord. Such minor points of differences as did occur were solved in the discussion. The workers from both New York and Pennsylvania felt that there are many apple growers who will not get good scab control unless lime sulphur is used.



Some of the larger commercial growers who do a more thorough job of spraying are able to use weaker fungicides in some of the sprays.

The methods of conducting the spray services in the two States vary slightly to meet the conditions existing in the States. In New York, where fewer departmental specialists are available, the county agents, in consultation with fruit specialist, make up and send out the letters. However, it was pointed out that under these conditions, where the county agents are responsible for sending out the spray letters they had received special yearly training at the college.

In Pennsylvania, where it is impossible to draw on a large graduate school, the plant-disease specialist must assume the responsibility of checking disease conditions and supplying county agents with the material to be sent to the growers. Both systems have proved to be very effective, and records show that where spray services have been followed growers have held their diseases to a point where there is no commercial reduction in the value of the crop.

The need for combating the severe and extraordinary outbreak of fire blight was discussed. Both States cooperated in preparing a fire-blight-control program, which included winter eradication of cankers and spraying with a 1-3-50 bordeaux spray.

Vegetables, Charles Chupp, discussion leader. Pennsylvania reported that tomato acreage is increasing very rapidly, and that with the general increase in acreage tomato diseases are becoming of first importance. Disease-control programs, using seed treatment, seedbed sterilization, and seedbed spraying, have been very successful in controlling canker diseases. Where demonstrations were conducted, this treatment increased the yield on plants from within or without the State from 33 to 50 percent. At one canning company where growers planted disease-free plants as compared with diseased plants from unknown sources, the percentage of good tomatoes was increased by over 27 percent.

New York reported success in preventing tomato diseases by the use of seed treatment and spraying with copper. It was pointed out that the use of milder copper materials, like copper oxychloride, does not injure the blossoms and reduce the set as much as does bordeaux. New York reported that through cooperation with seedsmen and commercial agencies they have been able to get a high percentage of the cabbage seed sold in New York treated for the prevention of diseases.

It was brought out that the present control of bean diseases was disease-free seed. However, certain seed sources in the West, which had heretofore been considered free of disease this year supplied seed that was, in at least some instances, infected with halo blight. Both States agreed that the disease-control program on cucurbits should consist of corrosive sublimate seed treatment and spraying or dusting with some of the milder materials, as copper oxychloride. Agreement as to recommendations was reached on the control of celery diseases, damping-off of seedlings, and soil sterilization.



Cereals, R. S. Kirby, discussion leader. Both States reported that some of the newer forms of mercury, such as ethyl mercury phosphate, are as satisfactory as the older treatments, and on account of their numerous advantages are being more generally used by the growers. Stinking smut was reported as being on the increase in New York, while in Pennsylvania it is still severe in certain areas where seed treatment has not been generally adopted by the growers. Barberry eradication was reported as being of help in reducing stem rust in Pennsylvania. New York reported that to date barberries have not been found to be the cause of serious rust spread.

The following resolutions were adopted:

- "1. Conversations at this meeting have developed the fact that recommendations for potato spraying in New York and Pennsylvania are not entirely in harmony. The specialists from each State are not sufficiently sure of their ground to insist that they have the final answer. This would suggest research on the following points: (a) High to low bordeaux as against standard formula; (b) high or low lime in the bordeaux as against equal amounts; and (c) best kind of lime to use in preparing bordeaux mixture.
- "2. It is uncertain as to whether or not barberry eradication will be of practical use in reducing wheat stem rust losses in certain New York counties, and it is recommended that the necessary investigations and surveys be made to help determine that point.
- "3. In view of the profit resulting from this meeting, it is recommended that another similar meeting be held within the next 2 years.
- "4. The members of the conference wish to thank the business management of the Lycoming Hotel for their courteous service and attention."

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Dr. A. L. Pierstorff is now devoting full time to resident teaching in botany and plant pathology at Ohio State University, and Dr. C. C. Allison, formerly with the United States Bureau of Plant Industry, Division of Tobacco and Plant Nutrition, with headquarters at Greenville, Tenn., has accepted the position of extension plant pathologist for Ohio. Dr. Pierstorff will continue his interest in the extension work with which he was so successful. The radio fruit-spray service which he and T. H. Parks have developed over a period of years has been outstanding as an extension project and as a service to fruit growers of Ohio and adjacent States.

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## MILO RESISTS BLIGHT

More than 20,000 pounds of the new strain of blight-resistant milo have been distributed to 600 farmers in 52 Texas counties where it will be grown for demonstration purposes and for further distribution, E. A. Miller, agronomist for the Texas Extension Service, has announced. The distribution was made within a period of 3 years of the first commercial appearance of the disease, an outstanding example of the value of agricultural research, Miller pointed out. The experiments were done at the Texas A. & M. Experiment Station under R. E. Karper, in charge of the station's sorghum investigations. The soil-borne disease was first noticed in dwindling milo yields in 1935 when it was estimated that as much as 50 percent of the milo acreage in high-producing centers was destroyed. Importance of the disease can be judged from the fact that of the 60,000,000 bushels of grain sorghums grown annually in Texas, about 45,000,000 is milo. (Dallas News, May 26, 1938.)

## RESEARCH SHOWS WAY TO WHIP MILO DISEASE

Usually complaints of farmers that a crop disease is causing great losses set the plant doctors to work. But pathologists in the United States Department of Agriculture and in cooperating States have identified and whipped root rot of milo, one of the grain sorghums, before most farmers knew what was wrong with their fields.

The symptoms of root rot or "milo disease"--dead, dying, or stunted plants--are similar to drought or chinch-bug damage in western Kansas, Oklahoma, and Texas. Here the dwarf milos are the one feed-grain crop that dry-land farmers count on.

Trouble in experimental plots of milo was observed about 10 years ago at Garden City, Kans., and Chillicothe, Tex. Pathologists, trained to look beneath the surface in studying any plant disease, examined the roots of these withered milos. They found the small roots dead, and the larger roots and crowns decayed and discolored. They also determined the cause, a member of the Pythium group of organisms which causes root rots of important grass plants in many countries.

The next step was to find resistant milos. Seed of many strains of the susceptible milos and Darso--a grain sorghum which substitutes for milo in the chinch-bug belt running through eastern Kansas and Oklahoma--was planted in soil infected with root rot. Because sorghum plants usually show either good resistance to root rot or no resistance, it did not take long to select several resistant strains. One of these, a dwarf yellow milo named Finney, was chosen for distribution about 3 years ago. Last year an estimated 10,000 acres was grown. This year there should be ample seed of Finney and other resistant milos for the root rot regions, says Dr. J. H. Martin, in charge of grain-sorghum breeding for the Department of Agriculture.



Milos resistant to root rot in the island section of the lower Sacramento Valley of California also are being developed. Seed from five resistant plants observed in a farmer's field in 1935 by Dr. Martin were multiplied by the grower so that about 1,300 bushels, enough to plant about 9,000 acres this year, were produced on a 10-acre field in 1937. Additional resistant strains have been developed by the California agricultural experiment station. Root rot spreads rapidly on the sub-irrigated soils there. Milo, the feed-grain crop, is a failure if nonresistant varieties are planted on such fields for more than 2 years.

--U. S. Dept. of Agr. Press Service  
Release, March 20, 1938.

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#### SEED TREATMENT IMPROVES CORN STANDS

According to W. J. Henderson, extension plant pathologist in Colorado, the percentage increases in stand of field corn from seed treatment with organic mercury dust in 23 farmers' demonstrations in 1937, were as follows: 19.5, 23.8, 19.5, 16.8, 14.3, 16.4, 24, 15.1, 22.7, 24.6, 22.7, 2.5, 16, 51.5, 9.2, 13.6, 28.6, 21.5, 21.3, 24.3, 35.4, 39, 9.7, average 19.9. It is understood that similar demonstrations in 1938, a year of dissimilar weather conditions, showed equally beneficial results.

#### SEED CONDITIONING PLANT FEATURES OKLAHOMA ELEVATOR

"A special seed-cleaning plant, fitted with a combination seed grader and treater, is a feature of the new elevator of the Farmers' Cooperative Association, at Hobart, Okla.

"Stinking smut has long been a problem in the southwestern Oklahoma wheat-growing regions north of the Wichita Mountains, where Hobart is located at the junction of the Frisco and Rock Island Railroads. The educational efforts of grain dealers have taken effect among the farmers. Seeding time is a busy time for the elevators. Farmers bring in their seed wheat to be treated with copper carbonate.

"The elevators have been able to make seed treating pay from the standpoint of the service rendered as well as from the standpoint of improved yield and quality of local wheat. At the Farmers' Cooperative Association plant this service earns 5 cents per bushel gross, plus the cost of the copper carbonate.

"The seed-treating plant is a frame building 36 feet high attached to the north side of the company's new elevator. At the top of this building are three bins, which receive grain through a turnhead from a spout leading from the distributor in the elevator. Each of these bins spout into the seed grading and treating machine which grades and applies copper carbonate



to seed wheat at the rate of 150 bushels per hour, spouting it into waiting vehicles in the driveway."

--From Grain and Feed Journals  
Consolidated 80:72, July 1938.

#### WHEAT SEED CLEANED IN SOUTHERN INDIANA

Eight counties in southern Illinois and eight in southern Indiana, the sections bordering the Wabash and Ohio Rivers, are enjoying the benefit of 10 portable seed-wheat cleaning and treating machines through the cooperation of the extension division of Purdue University, the University of Illinois, and the research division of Igleheart Bros., of Evansville, Ind.

During the 1937 fall sowing season these machines, moving from farm to farm cleaned 149,539 bushels, and treated 29,942 bushels of seed wheat in Knox, Posey, Gibson, Vanderburgh, Daviess, Sullivan, Warrick, and Spencer Counties in Indiana; cleaned 61,438 bushels and treated 22,462 bushels in Wabash, Edwards, Wayne, White, Gallatin, Lawrence, Washington, and Richland Counties in Illinois. In the 16 counties the 10 machines cleaned a total of 210,977 bushels of seed wheat and dust treated 52,404 bushels to protect it from smut.

Cleaning up the smut hazard leads among the purposes of the machines. In both States smut has often ruined a farmer's wheat for milling purposes. These portable cleaning and treating machines play a dual role insuring a larger yield of better wheat and free from foreign matter.

--Grain and Feed Journals Consolidated,  
Feb. 9, 1938.

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We have 20 portable seed-cleaning and treating machines in operation in Illinois now and several prospects for additional ones to be purchased and made available for use next spring.

--J. C. Hackleman, Extension Agronomist  
Illinois, Sept. 26, 1938.

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R. E. Vaughan of Wisconsin says that a practice that has passed through the active extension stage is the use of wilt-resistant strains of canning peas. These strains are now so generally grown that it is difficult to secure enough susceptible Perfection seed for demonstration purposes.

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## INSOLUBLE COPPER FUNGICIDES GIVE PROMISING RESULTS

There follows the summary of the article by J. D. Wilson and H. A. Runnels of the Ohio Agricultural Experiment Station reporting their experimental work with various insoluble copper compounds as vegetable sprays. (Ohio Agr. Exp. Sta. Bimonthly Bull. 43:48-55. 1938):

"Bordeaux mixture is still the most commonly recommended and used material for spraying vegetables, but the search for a substitute on plants sensitive to it is becoming more active each year. Any material or materials which may be chosen to replace bordeaux mixture will probably be found among the relatively insoluble copper compounds which are now being placed on the market by various chemical companies.

"A number of these have been used on vegetables for the control of various diseases during the past 5 years, and some offer considerable promise. Two chlorides of copper (basic copper chloride and Cupro-K, a copper oxychloride) and Coposil (copper ammonium silicate) used in the basic dust formula (1-8-1\*) have given excellent results on cucumbers and muskmelons and are recommended on these crops in preference to bordeaux mixture or copper-lime dust. The same materials used in the basic spray formula (4-4-50\*\*) increased the yield of tomatoes when disease was severe enough to be a retarding factor in fruit production and are recommended as substitutes for bordeaux mixture on this crop, both in the seedbed and in the field. These same materials were found to compare favorably with bordeaux mixture on carrots, celery, and ginseng but can hardly, as yet, be recommended to replace bordeaux here because of their relatively greater cost.

"A number of other insoluble copper compounds, such as Copper Hydro 40, Cuprocide 54, basic copper sulfate, and copper phosphate, have been tested also. Some of these gave good results in particular instances, but, on the basis of results so far obtained, none can be as highly recommended as substitutes for bordeaux mixture as can basic copper chloride, Cupro-K, and Coposil.

"Additional work is now planned to determine the best, and at the same time most economical, concentrations of some of the most promising insoluble copper compounds to use in the control of specific diseases."

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James Godkin, extension plant pathologist, Blacksburg, Va., has resigned to go into business in southwestern Virginia. He has rendered 15 years of valuable service to agricultural extension in that State.

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\* One part insoluble copper compound, 25 percent content, 8 parts wheat flour, 1 part calcium arsenate.

\*\*Four pounds insoluble copper compound, 25 percent content, 4 pounds some material like wheat flour, 50 gallons water.



## TOMATO DAMPING-OFF CONTROL

The most important work with tomatoes in New York during 1936 was the control of damping-off. The research work of Dr. James G. Horsfall made it possible to give very accurate recommendations. These were to treat the seed either with red copper oxide dust or with a copper sulfate solution (2 ounces in 1 gallon water). After the seedlings are up, they are sprayed three or four times with red copper oxide, (1 pound in 50 gallon water). In checking up on results the plant grower of one canning company informed the extension specialist that the company always expected to discard 10 to 50 percent of the flats because of damping-off. In spite of the fact that the spring of 1936 was favorable for damping-off, they grew 2,300,000 plants without the loss of one flat, which was a new experience for them. Another company grew 1,250 flats of 100 plants each, without the loss of a flat, which also was their first year in being so fortunate.

--Charles Chupp, Extension Plant  
Pathologist, New York State College  
of Agriculture.

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Dr. C. B. Smith, assistant director of the Extension Service and chief of the Division of Cooperative Extension, United States Department of Agriculture, retired at his request on October 31, after 30 years of active extension work and 42 years of service in the Department. Extension workers generally will miss the wise guidance and kindly counsel which he gave so generously. He is looking forward to many happy days at the old homestead near Atlanta in northern Michigan where he can get close to nature and enjoy the science of agriculture. Our best wishes go with him.

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## OUTLINE OF EXTENSION PROJECTS IN PLANT PATHOLOGY NORTH CAROLINA, 1939\*

By  
Luther Shaw, Extension Plant Pathologist  
and O. P. Owens, Assistant

Following is a brief outline of projects in plant pathology which are suggested for inclusion in the county program in those counties where problems exist.

### A. Tobacco Diseases:

#### 1. Blue-mold control

Experimental work toward the development of control measures for blue-mold control has progressed to the point that it now

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\* For use of county agents in making plans for 1939.



appears definite that some extension work should be done on the problem in every tobacco-growing county in the State, provided weather conditions and mold development in regions to the south indicate severe development of the disease in North Carolina in 1939.

It is planned to conduct 10 result demonstrations with each of three promising mold-control treatments; namely, cuprous oxide spray, benzol vapor, and paradichlorobenzene vapor. It is desired to have all three treatments set up on the same farm in each case, and from one to two such demonstrations per county.

In addition to the result demonstrations, meetings and method demonstrations should be held in all the tobacco-growing counties for the purpose of describing and demonstrating the various methods of blue-mold control.

The extension plant pathologist will be glad to attend as many of these meetings as possible and assist in the discussion and demonstrations.

## 2. Other tobacco diseases

For the past 2 years county-wide farmer meetings have been held in a number of the tobacco-growing counties for the purpose of discussing tobacco diseases and their control. A series of lantern slides illustrating the major tobacco diseases was shown at these meetings. Time will be available for about 20 of these meetings in 1939 if desired.

## B. Cotton Diseases:

### 1. Damping-off control

For the past 3 years a large amount of time has been devoted to the extension program on the control of damping-off of cotton by treating the seed with 2 percent Ceresan. Result demonstrations and meetings on this problem have been conducted in a large number of counties, and it is evident that some cotton seed has been treated in practically every cotton-growing county in the State. However, about five-eighths of the cotton seed planted in North Carolina in 1938 was untreated. Hence, there is still opportunity for considerable extension work on this problem; especially of the more strictly promotional type, such as local news articles, circular letters, community meetings, etc. It is suggested that you consider these types of extension activities in planning your program on cotton-seed treatment for 1939.



It is not planned to conduct a large number of result demonstrations on cotton-seed treatment in 1939, as has been done for the past 3 years. However, it is our desire to conduct a limited number of result demonstrations on the problem in 1939. Hence, we would like to plan four demonstrations for each of six counties, or a total of 24 demonstrations.

C. Diseases of Horticultural Crops:

Diseases of horticultural crops are common and destructive throughout the State, and there is a large amount of extension work that should be done on them. However, because of the wide field to cover, it would be impossible for the extension pathologist to outline a program covering the field and follow it up adequately. Therefore certain specific problems have been selected for inclusion in the 1939 programs. Some of these are continued from previous years' work and others are new ones.

1. Control of leaf spot diseases of strawberry

Demonstrational work on the control of strawberry leaf spot diseases by spraying with bordeaux mixture has been in progress for the past 2 years, and outstanding increases in yield of berries have resulted from the practice. The 1939 program should be centered around (1) result demonstrations, (2) news articles, (3) circular letters, and (4) farmer meetings designed to promote wise and careful adoption of the practice of spraying in both commercial and home production of strawberries.

2. Cabbage diseases

Result demonstrations on the control of cabbage yellows with resistant varieties have been conducted for the past 2 years in the mountain cabbage-growing area. These demonstrations have been conducted with the primary objectives of determining the yellows-resistant variety or varieties best adapted to our mountain area. Further result demonstrations on this problem are planned for 1939. Those agents desiring these demonstrations should enter them into their plan of work.

3. Watermelon diseases

Several of the agricultural experiment stations and seed dealers in recent years have recommended and sold seed of various varieties and strains of wilt-resistant watermelons. It is proposed to conduct at least four result demonstrations in 1939 with the more promising wilt-resistant strains of watermelons.



D. Cereal Crop Diseases:

1. Seed treatment

A survey made in 1937 indicated that not more than 30 percent of the small-grain seed planted in North Carolina is treated and that in many cases the most effective treating material is not used. It is therefore planned to start an extension program on seed treatment of small grains designed to increase the practice of seed treatment with the best-known treating materials. The following extension activities are planned: 14 seed treatment demonstrations in 14 counties; farmer meetings in those counties desiring them to discuss cereal seed treatment, show lantern slides on the subject, and demonstrate effective methods of treating; news articles; and circular letters. Agents desiring to increase the practice of small-grain seed treatment in their counties should enter this project in their plans.

2. Disease-resistant varieties

It is planned to conduct, along with the seed-treatment demonstration, result demonstrations with smut-resistant varieties of oats and barley.

E. General Field Crops:

1. Peanut diseases

For the past 2 years result demonstrations have been conducted on the control of peanut leaf spots with sulphur dust. It appears now as though this problem will be ready for additional promotional work in 1939. Therefore the following extension activities are planned: 12 result demonstrations in 6 counties; news articles, circular letters, and farmer meetings in those counties desiring them. Lantern slides will be available for use at the meetings.

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On account of severity of potato late blight in Wisconsin this year the seed to be planted in 1939 will carry considerable infection. R. E. Vaughan is planning on giving increased emphasis to the spraying program next year.

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